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E-Primer Series

## **No. 5: eXtending possibilities**

**Mark Nichols**

E-learning specialist

Laidlaw College, Auckland, New Zealand

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Updates available from <http://e-ako.blogspot.com>

Author can be contacted at [mnichols@laidlaw.ac.nz](mailto:mnichols@laidlaw.ac.nz)

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## **5.0 eXtending possibilities**

As E-Primer 1.3.2 mentioned, any contemporary look at e-learning must consider those applications that have the potential to transform teaching and learning beyond the class-centric confines of the VLE (Virtual Learning Environment). While ePortfolios and blogs are increasingly included within VLE systems, they tend to be associated with a user's own profile rather than any particular class area – which is why such tools have the potential to move e-learning beyond artificial class boundaries, and into the public domain of the Internet. Wikis can also be made publicly available, and place emphasis on a shared outcome rather than the particular input of any individual. Wikis, then, have clear potential for collaborative activity beyond semesterised timeframes. Virtual worlds such as Second Life invite learners into new educational experiences. Social networking sites such as Ning communities, MySpace, Facebook, YouTube and Flickr encourage the distribution of ideas, perspectives and artefacts and the forming of new online connections. 'Web 2.0' is upon us. Collaboration, sharing, openness, authenticity, inclusiveness are the core values; 'produsage', 'long tail', 'wisdom of the crowd', 'mashup' and 'folksonomy' are among the terms created to help describe the novel contributions and challenges Web 2.0 is bringing to consumerism, business, collaboration and publishing, media development and epistemology.

This has been the most difficult E-Primer in the series to prepare. Firstly, it is difficult to find *empirical* research in the use of Web 2.0 applications in education. As perhaps should be expected, the more relaxed and informal connections Web 2.0 inspires has led to discussion about Web 2.0 in education that is largely relaxed and informal! I recently asked one internationally-renowned expert in distance education about the availability of Web 2.0 research in his specific area of interest. His response: one report, however “the data was very much of the 'students liked it so it must have had an affect' variety”. Fortunately there have been recent (2008) publications of various dedicated journal issues featuring primary studies, which I have drawn on wherever possible. In reviewing the literature I was struck by the frequency of the terms 'fun', 'were impressed by the technology', 'has the potential to' and 'more enjoyable'. While this in itself is no cause for alarm, the warnings of Postman (2006:14) are pertinent: “in every tool we create, an idea is embedded that goes beyond the function of the thing itself”. The objective of higher education is not primarily *fun*, rather it is cognitive transformation – and this involves hard work. Higher education exists to broaden minds, to make people thinkers. If making learning 'fun' can assist in this, then it is a worthy pursuit; but fun on its own is far from a good criterion for applying technology to education. I am not aware of any hard evidence to suggest that the link between 'fun' and better learning actually exists. Likewise, *potential* is only as useful as it is able to be harnessed.

Secondly, there is substantial rhetoric on whether Web 2.0 gives us opportunity to overthrow the chains of formal education and emancipate learners into a world of collaborative exploration. If Web 2.0 connects people and ideas, the argument goes, why do we need

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formal institutes of learning? Associated with these questions is the matter of the Net Generation of learners, also termed the Millennials or the 'Digital Natives'. What are their expectations of education? Could it be that the traditional practices of formal education are no longer appropriate? It is profitable to engage with such questions, which stretch beyond the technicalities of Web 2.0 tools into fundamental ideas of what it means to educate. The adoption of tools outside of institutional VLEs requires that attention be given to the role of higher education itself.

Finally, there is the question of which specific tools to consider for this E-Primer. Blogs and wikis are clearly examples of Web 2.0; ePortfolios and m-learning are not widely considered elements of Web 2.0, yet are still relevant for eXtending e-learning practice. Podcasts, digital video, simulations, mashups, use of open educational resources (OERs) and social networking sites are not specifically addressed here. Rather than discuss all possibilities, I have elected to focus on some that have current appeal and a mature literature – ePortfolios, blogs, wikis, MUVES (Multiple User Virtual Environments) and m-learning – in an attempt to frame the sorts of issues and potential these might hold for higher education. I am not trying to be comprehensive in my coverage of additional possibilities.

So the great challenges to preparing this E-Primer have been the multiplicity of voices and opinions, perspectives and agendas in areas of e-learning that are theoretically largely untitled yet are abuzz with practical activity and promise. This E-Primer intentionally seeks to place Web 2.0 firmly within the context of formal education and empirical research. My starting point is, unapologetically, formal education. Web 2.0 and the connectivity it encourages have certainly transformed what it means to share information, and have brought about new means of collaboration; but it is important not to overstate its potential for formal education. While the concern of this E-Primer is not solely Web 2.0, the eXtending tools discussed here are placed in a particular framework based on an initial analysis of Web 2.0.

## ***5.1 Web 2.0 and the Net Generation***

Web 2.0 is popularly labeled the 'read/write' or 'social' Web, in that it is a participative and collaborative expression of the Internet. Tools such as blogs, wikis, social bookmarking sites and file sharing services such as YouTube and Flickr make it easy for Internet users to express themselves and connect to other people's ideas. An emerging literature is considering the potential of Web 2.0 on education and its effect on emerging generations.

### **5.1.1 The phenomenon of Web 2.0**

Web 2.0 is characterized by creativity, collaboration, communication, openness, microcontent, sharing and user-centredness (Alexander, 2006; Solomon & Schrum, 2007). Its

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various services include blogs, wikis, tagging and social bookmarking, multimedia sharing, audio blogging and podcasting, and RSS syndication alongside forms of social networking (Anderson, 2007).

The enabler of Web 2.0 is RSS (Rich Site Summary, or Really Simple Syndication). RSS is a technology that enables Internet users to subscribe to a blog, wiki, podcast series or user's account enabling them to be alerted when something changes. A new blog post, for example, will be 'pushed' to subscribers of the blog, saving subscribers the need to constantly check the blog for new content. Using RSS, users can subscribe to those bloggers, wiki entries, podcast series and users whose work most inspires them.

That the Internet, particularly through Web 2.0 services, is changing society is undeniable. The use of social networking tools is almost ubiquitous; even so-called 'Web 1.0' has influenced daily life. As stated by Rainie & Horrigan (2005:np):

A decade after browsers came into popular use, the Internet has reached into—and, in some cases, reshaped—just about every important realm of modern life. It has changed the way we inform ourselves, amuse ourselves, care for ourselves, educate ourselves, work, shop, bank, pray and stay in touch.

Work by the Pew Internet and American Life Project reveals the staggering degree of online activity in the United States, where online activity is becoming representative across the population. It is important however not to overstate the influence of particular Web 2.0 tools. Solomon and Schrum (2007:14) for example state that “[t]he United States has become a nation of bloggers” just one sentence before they cite their evidence: 40% of the 147 million US Internet-using population say that they read blogs, whereas only 8% write them. With an overall population of about 300 million, the 'nation of bloggers' has significantly more people who do not read blogs (80%) than do. Indeed, blogging actually attracts a relatively small subset of online users (Lenhart & Fox, 2006; Lenhart & Madden, 2005; PewInternet.org, 2005; see also Anderson, 2007). Further, only about 20% of the US population uses Facebook (New Zealand has about an 18% penetration). While the adoption of Web 2.0 tools can be overstated, their influence on users is not insignificant. The Internet is viewed as an authoritative source of information for big decisions and major life episodes (Horrigan & Rainie, 2006), and such influence comes from both static Web pages and online networks.

Bruns (2008) suggests that Web 2.0 fundamentally alters value chains, whereby collaborative effort that was once possible only through formal or commercial management is now possible through the informal means of online networking. The differences between producers and users is no longer clear-cut; Bruns coined the term 'producers' to describe those who both produce and make use of information and services through online networks. *Wikipedia* and open source software are cited by Bruns as evidence of this shift.

### **5.1.2 Web 2.0 and education**

Bruns (2008) argues that, just as Web 2.0 'produsage' has transformed journalism (newspapers vs blogs), software development (commercial vs open source) and information services (*Wikipedia* vs *Encyclopaedia Britannica*), so it must transform education (see also Richardson, 2006). Bruns suggests that traditional education relies on “the artificial scarcity imposed by traditional production and accreditation processes” (2008:344) and a sender (teacher) to receiver (student) relationship. The scarcity of information is challenged by the resources available over the internet; the sender-receiver relationship is challenged by the collaborative produsage that is characteristic of Web 2.0. This position is similar to that of Daanen & Facer (2007:19), who question the role for education in a Web 2.0 world:

The ability to record and retrieve all experiences requires a debate on the purpose and function of education: what is its goal when all information – from facts, to skills advice – is constantly accessible?

Ito et al (2008:2), who studied the online behaviour of US teens<sup>1</sup>, add that:

New media allow for a degree of freedom and autonomy for youth that is less apparent in a classroom setting. Youth respect one another's authority online, and they are often more motivated to learn from peers than from adults. Their efforts are also largely self-directed, and the outcome emerges from exploration, in contrast to classroom learning that is oriented toward set, predefined goals.

Given these shifts in context, what ought to be done? Bruns proposes that faculty should become 'guides on the side' and establish themselves as leading members in a community of producers, “facilitating and guiding learner engagement in the wider knowledge space” (2008:349). Ito et al's (2008) call for 'peer-based learning' echoes this sentiment, with the helpful suggestion of including a broader network of people in education also made. Many edubloggers ('education bloggers') advocate Web 2.0 as the means by which traditional education might be ended in favour of a lifelong and personalised learning age, either unmediated by formality or else characterised by student-directed and fully collaborative learning (see, for example, Bryant, 2007; Downes, 2005; Owen et al, 2006; many edubloggers also favour such an approach). Such a system might be based around a learner's own blog, ePortfolio or Personalised Learning Environment (Downes, 2005, 2007; LaCour, 2005). Barnes & Tynan (2008:189) also argue that change is required at the tertiary level:

The latest generation of undergraduates already live in a Web 2.0 world... To attract and retain these students, universities will need to rethink their operations. New social technologies mean that universities have the chance to create a new generation of student-centred learning environments, to realize the idea of a University 2.0.

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<sup>1</sup> Ito et al's (2008) study focuses on youth, not a specific education sector.

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Savin-Baden (2008) argues that Web 2.0 in the form of open or social software and MUVES such as Second Life should cause a revaluation of higher education: “For students who spend six hours a day on social networking and just over three hours a day on email, surfing the net and instant messaging... it is clear universities need to rethink learning in immersive worlds” (2008: 159). Ally (2009:1) presents the utopian vision for m-learning:

Learners will not have to wait for a certain time to learn or go to a certain place to learn. With mobile learning, learners will be empowered since they can learn whenever and wherever they want. Also, learners do not need to learn what is prescribed for them.

Consider, too, Warlick's (2007:12-13) account of how the new generation learns:

During his junior year, my son started making videos with a digital video camera... he was not merely taking video with his camera and then editing sequence. He was mixing in audio from the Internet, CDs and DVDs, video clips collected from his friends, still images he had taken and downloaded from the net, and even staged video from online video games, where players followed direction and acted out scenes on a virtual stage from their homes across the globe. I did not teach him how to do this... his high school teachers... did not teach him how to do this. He taught himself, with the help of his social network of people, with whom he IMs, text messages, shares MySpace pages, plays in the metaverse of video games, and through venues I am sure I do not even understand yet. He knows how to use this new read/write web to learn what he needs to know, in order to do what he needs to do, now! It's how this generation learns. It's how they use information.

The perspective that formal education has been superseded by Web 2.0 is easy to come by. However such views all make assumptions about the nature of education itself. Many critics of traditional education systems who advocate a Web 2.0-based approach to teaching and learning tend to have a rather one-eyed perspective of what happens in higher education settings. Frequently, the position is that information is freely accessible through the Internet, and it now much easier for people to share ideas and collaborate than ever before. The old model of didactic presentation of abstract information, followed by testing, is out; authentic tasks and collaboration, preferably collaboration that creates something that can be shared, are in. Instructors should no longer spout forth as fountains of knowledge, and should instead busy themselves with empowering students to learn things for themselves. Unfortunately such arguments tend to ignore the broken middle, which is where polarised positions tend to co-exist in dynamic tension (see Tubbs, 2005); didactic teaching and students' learning for themselves are commonly presented as opposites, whereas the two are actually complementary. Further, education is not based on providing students with access to information. Instead it is properly concerned with information becoming knowledge and understanding in the minds of students, to enable the transformation of the student such that they are empowered to see the world through a broader lens (Mezirow 1990, 2000).

Web 2.0-based critiques of education tend to assume the following:

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1. Teachers claim a monopoly on authoritative information.
2. In tertiary formal education contexts, students are not free to think for themselves or consult sources not authorised by the teacher.
3. The enthusiasm and self-direction students apply to learning about things that implicitly interest them are readily transferable to a broader curricula.
4. The ability to find information online and interact with peers is evidence of mature research skills.
5. Collaborative work testifies to the contribution and understanding of each participant.
6. Students are able to competently navigate information sources and perspectives within a particular discipline (even one that is new to them).
7. The resources and perspectives suggested by a qualified member of faculty are somehow (and usually) inferior to those a student might find through their peer network.
8. Information that is not 'just in time' is of the rather-less useful 'just in case' variety.

Each of these assumptions is highly questionable. The 'just in time' versus 'just in case' perspective is particularly insidious. The issue is better framed as differentiating between that information which is more useful *immediately*, and what is more useful *conceptually*.

Consider Plato's cave, Marx's critique of capitalism, studying the history of Western Europe, analysing the themes from *One flew over the cuckoo's nest*. Some learning that may seem 'just in case' is actually contributing to the development of a far deeper cognitive framework in the mind of the student. It is with such cognitive development that education is concerned. Very seldom, if at all, will memorisation, regurgitation of facts and a search for 'the answers' earn an undergraduate degree. Instead, graduates have learned to appraise, compare, contrast, critique, evaluate, and come to their own informed conclusions with reference to others' ideas<sup>2</sup>. In Laurillard's (2002:12) words, "learning is not just about acquiring high-level knowledge. The way students handle that knowledge is what really concerns academics". The outcome of formal education is not necessarily in-head information, but rather new ways of being able to use information as a tool. Formal higher education is more properly considered *transformative* (Mezirow, 1990, 2000), rather than *informative*. One of the key rationales of formal higher education is exposing people to ideas and perspectives that result in them seeing the world differently, considering ideas that they may never have opportunity to encounter through everyday experience. As a colleague at my own College recently remarked, we can only think with the ideas that are available to us. Education exposes students to new ideas, whether their value for immediate application is appreciated or not.

Gilbert (2005) argues that education must move on from preparing learners for the industrial age toward preparing them for a knowledge society. Such a shift involves requiring learners to focus on creating new knowledge rather than reproducing existing knowledge, and emphasises collaborative rather than individual learning tasks. Rather than being a 'thing', Gilbert maintains, knowledge should be considered "a form of *energy*, something dynamic or

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2 In the same way, postgraduates are expected to become comfortable navigating complex and conflicting points of view, and to determine and defend their own position within these points of view.

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fluid, something that *does* things, or makes things happen” (Bolstad & Gilbert 2006: 30, emphasis original). In the paradigm shift proposed by Gilbert (2005), the content- and assessment-driven approach used in formal education should be replaced with one based on knowledge production. Such an approach is more consistent with the demands of a knowledge society, where people “need to be able to learn in groups as well as on their own, and they need to know how to create new knowledge” (Bolstad and Gilbert, 2006:30). In other words, education should provide students with the skills they require to learn for life and to create new knowledge for the situations that demand it. While this perspective might be considered unanimous among edubloggers and critics of the incumbent education system, what Bolstad & Gilbert (2006:30-31) add next is of paramount importance:

...this does *not* mean that the 'old' knowledge that is the basis of the present curriculum is no longer important. It is still important, and students still need to learn it, but in the post-industrial age the *reasons* for learning it are now different. Instead of learning it for its own sake, or so that it can be preserved and passed on, students need to understand 'old' knowledge so that they can use it to develop *new* knowledge. If they are to do this, they need to understand it at the 'big picture', 'systems' level, not at the level of detailed facts... Traditionally, this kind of understanding was developed only in those who went to higher education...

Bolstad and Gilbert point out that familiarity with 'old' knowledge provides a vital foundation for development of 'new' knowledge and that, from their perspective of formal secondary education, higher education *is already configured* to provide learners with the 'big picture' and 'systems level' perspectives that prepare them for the development of new knowledge. From this perspective, Web 2.0 and other eXtended uses of technology might be considered conduits for what higher education is already concerned with, rather than a reason for overhauling the system. Formal education does not properly view its knowledge as an end, but rather as a means.

It is timely to note the important difference between considering Web 2.0 *as a substitute for* formal education and Web 2.0 *in the context of* formal education. In this E-Primer, the former position is absolutely rejected. Formal education has an important role to play, mainly because it is concerned with a particular type of knowledge not immediately valued in everyday settings. Laurillard (2002) makes the following observations:

- There are differences between everyday knowledge and academic knowledge.
- Everyday knowledge is based on experience ('knowledge of the world'); academic knowledge is based on our experience of experience ('knowledge of descriptions of the world').
- Everyday knowledge tends to be highly situational however academic knowledge is more objective, transferable and generalisable.
- Everyday knowledge can be gained through everyday experience, whereas academic knowledge is necessarily mediated by experts with academic knowledge.



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Once the distinction between everyday and academic knowledge is made, the importance of formal education's unique contribution to learning become clear. Formal education is deliberately different from everyday learning, because it is concerned with different forms of information and knowledge. There is no necessity for formal education to mimic social developments, adopt popular tools or comply with individual preferences. The tail should not wag the dog. Higher education is not so much concerned with means as it is with ends. Transforming student thinking through academic knowledge is the end. Web 2.0 is a means, as useful only as it enables academic knowledge to hit its mark; the might also be said for authentic and collaborative learning.

So, while Web 2.0 will not fundamentally alter formal education, Mason & Rennie (2008: 2) note that

[i]gnoring social and technological trends is not the way forward for educators anymore than is chasing after every new movement because it is new... [we should develop] an open mind to the possibility that using some form of social software could be beneficial in most courses, given imaginative course design.

It is the application of Web 2.0 in the context of formal education that gives direction to this E-Primer. Nick Allen (in Miller, 2007:5) remarked that, unless Web 2.0 can “help students learn more, provide access to larger numbers of students, improve learning outcomes, or help faculty teach... institutions should not be distracted by them”. This is a good summary. As we will see, Web 2.0 tools may well have a role to play in higher education, but not a paradigm-changing one. Rather, the role is one of extension. The reason for this apparent conservatism rests not just in the nature of higher formal education, but also in the characteristics of the Net Generation itself.

### **5.1.3 The Net Generation**

The term Net Generation (or 'Net Gen') is one of many used to describe the generation currently engaged in schooling, and those who have recently passed from school directly into higher education. Net Genners are also commonly referred to as Millennial learners, Generation Y and the Digital Generation (Reeves & Oh, 2007). Prensky (2001) also suggested the terms 'digital native' and 'digital immigrant' as shorthand to differentiate between those who are brought up with digital technologies, and those for whom using digital technologies has come less naturally. Prensky's differentiation has been cited multiple times in e-learning literature over the last decade. Those citing Prensky's work usually do so with an urgent call for education to cater to the 'natives' who, Prensky suggested, would find traditional schooling a poor contrast to their more active, participative and creative online world. Digital natives are apparently multi-taskers and random-access users with a preference for multimedia, instant gratification and games, rather than serious work. Bennett et al (2008) describe this sort of revolutionary call as an “academic form of 'moral panic’”, which is still

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characteristic of some recent work (such as Hart, 2008).

Citing Oblinger & Oblinger (2005) and several other studies, Mason & Rennie (2008) describe Millennial or Net Gen learners as multi-taskers who enjoy collaboration and networked activities, are strong visual learners, prefer experiential activities, and who are techno-savvy. However Mason & Rennie (2008:8) add that other studies suggest that these learners have short attention spans, poor reflection skills, a lack of evaluative skills, connection with local friends rather than broad social networks, and “a cavalier attitude to quality of sources”. Reeves & Oh (2007:302) point out that generational studies frequently suffer from poor non-representative sampling, self-reporting as opposed to objective observation, and unsubstantiated stereotyping; they conclude that “[t]he gross generalizations based on weak survey research and the speculations of profit-oriented consultants should be treated with extreme caution in a research and development context”. Bolstad & Gilbert (2006:15) point out that many studies of the Net Generation extrapolate based on analysis of early adopters, and tend to homogenise young people, “implying that they all think and act in particular ways”. The underlying assumption is that the 'early adopters' studied will eventually represent the entire population. Even some large scale projects, such as the JISC LXP project (Conole et al, 2006), have questionable sampling such as drawing from the results of online surveys. Bennett et al (2008) note that many generational studies are cited uncritically by other commentators. Naturally, this results in a form of authority through citation, and so unfounded common sense or findings based on poor sampling soon become widely accepted.

Where more objective research does exist about generational characteristics it tends to conclude that:

- digital literacy or 'native-ness' is determined not by age, but socio-economic background
- there is no uniform sense of 'frustration' with formal education being expressed by young students
- particular generations are marked more by heterogenous complexities than homogenous generalities.

Expert opinion (CIBER, 2008) casts doubt on many claims made about the Net Generation, though some (such as competence with technology) are endorsed. A report from Becta (2008:8) found that while many young people from their survey were using Web 2.0 tools, there was “little evidence of young people engaging with the apparently creative scope of Web 2.0 or using these technologies in markedly original ways” (see also Sefton-Green & Buckingham, 1998, in Bolstad & Gilbert, 2006). The Pew Internet project has found that the Net Gen is more likely to use the Internet for social interaction and entertainment; older Internet users are more likely to use it for research (Jones, 2009). Other studies cited by Bauerlein (2008) point to a generation that:

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- uses online tools for social engagement with one another (that is, communicating within limited horizons)
- is impoverished for wider, cultural experience
- is not pursuing broad-based knowledge
- is simply not interested in reading.

Other reports warn that the Net Gen has an alarmingly pragmatic approach to searching for information. Online search results are accepted uncritically, and Net Genners tend to get frustrated when answers cannot be easily found (Bennett et al, 2008; CIBER 2008). The use of Google and Wikipedia as information sources is extensive across the Net Gen student body, with little distinction made between the rank of search findings and their relevance to the actual subject at hand (Pan et al, 2007). Other commentators point out the potential dangers to the Net Gen of relying on online search engines for easy answers. Jeanneney (2007), for example, notes that finding facts online is easy however addressing conceptual issues is far more difficult. A search for a ‘fact’ will reveal the answer quickly; a search for a concept or perspective is much more difficult to find using a search engine. These days it is easy to find a keyword across a mountain of books and blogs, but this does not automatically provide the context. This is particularly the case with books, which are designed to be read “sequentially and cumulatively” (Gorman, in Jeanneney 2007:68).

There is no doubt that the Net Gen has access to technology, and experience in its use. Oliver & Goerke (2007) report that some 88% of Australian undergraduate students in their survey use IM, 30% use blogs, and 22% podcasts. Only some 4% lacked Internet access outside of the University, 96% own a mobile phone, and 70% have an MP3 player. Perhaps surprisingly, though, the Net Gen are not the population segment most likely to make use of Web 2.0 tools. Healy (2009) observes that Web 2.0 services such as Twitter and LinkedIn are used mostly by users aged 35 or older. Further, Facebook's recent growth is taking place in the 35 to 54 year-old demographic. Healy (2009:np) concludes: “the numbers show that mainstream Gen Y is not latching on to the newest social media tools, and for a group of people who are supposed to be the trend setters, this is a strange phenomenon”.

Research findings also suggest that any perceived urgency for Web 2.0-based education is not driven by the students themselves. In a quantitatively significant study in the US, Salaway et al (2007) found that tertiary students prefer a ‘moderate’ amount of IT use in their courses and would actually prefer to have social networking tools left *out* of their education experience. A JISC report (JISC, 2007:29) investigating a sample of ICT-adept students aged between 15 and 18, reported that “The traditional methods of teacher/pupil learning seem neither hierarchical nor outmoded to them. They see personal, face to face interaction as the backbone of their learning”. The report concluded as follows (JISC, 2007:31):

Respondents found it hard to imagine using social networking sites for coursework or study, and had reservations about this when presented with the scenario... Young people are not

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constantly looking for new technology to incorporate into their everyday life. They appreciate and endorse it when they can see a palpable social or academic benefit.

Margaryan & Littlejohn (2008), in their study of engineering and social work undergraduate students, found that so-called 'digital natives' tend to use a limited range of online technologies and make limited use of social networking sites. These findings are similar to those of Kennedy & Krause (2008), who surveyed almost 2,000 University of Melbourne students. While ownership of digital devices is very high and Internet access almost ubiquitous, user profiles are extremely variable. Margaryan & Littlejohn (2008: 22) found that undergraduate students are not as familiar with online tools as is commonly believed, and that

students' attitudes to learning appear to be influenced by the approaches adopted by their lecturers. Far from demanding lecturers change their practice, students appear to conform to fairly traditional pedagogies... In fact students' expectations were that they would be 'taught' in traditional ways.

In New Zealand, a recent curriculum review held by the Ministry of Education (nd:np) found similar preferences from students consulted as part of the process. Interviewees from intermediate and secondary schools (from years 7 to 13) responded to questions about how they viewed success, what helped them to learn, and teachers.

Many perceived the advancement of technology as negative, especially in terms of making people "lazier". One student commented: "With technology, it seems as if things are automatically done for you... you won't go the extra mile to do things for yourself"... Other perceived disadvantages of the increased use of technology were that people would become less literate, less able to communicate at a personal level, and socially isolated or disjointed.

Further evidence from Sheehy & Bucknall (2008) from focus groups establishes that school-age students do not see technology as having the potential to transform education in any meaningful way according to their own perceptions. However literature does establish that Web 2.0 plays a part in the formal education of a growing number of learners. Conole et al (2006:5) found that students are making use of their peer networks and multiple information resources (including the Web and hard-copy books) in formal education as convenient to them, "appropriating technologies to meet their own personal, individual needs". These findings are in accord with the JISC (2007), Becta (2008) and Salaway et al (2007) reports cited above. Conole et al (2006:6) note that:

They [students] are generally sophisticated users, using technologies in a variety of different ways to support different aspects of their learning. They are critically aware of the pros and cons of the use of different technologies and 'vote with their feet' – i.e. they don't use technologies just for the sake of it – there needs to be a purpose and clear personal benefit. They have an expectation of being able to access up to date and relevant information and resources and see this as vital. They don't see the technology as anything special; but see it as

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just another tool to support their learning.

Students may well be working differently as a result of Web 2.0 (see also Owen et al, 2006), but there is, in the reports cited, no *imperative* to integrate social networking or other Web 2.0 functionality into formal education. Students may well use Web 2.0 *anyway* as a part of their own engagement with formal education, which is entirely laudable. It seems that the flexibility that technology can add to education is of much more importance to students than any particular pedagogical shift (Kennedy & Krause, 2008). Margaryan and Littlejohn (2008:1) note that “although the calls for radical transformations in educational approaches may be legitimate it would be misleading to ground the arguments for such change solely in students' shifting expectations and patterns of learning and technology use”.

## **5.2 The Conversational Framework**

So far the potential for Web 2.0 in formal education has not been presented in glowing terms. Web 2.0 is not so ubiquitous as it is often portrayed, and neither are Net Gen students counting on its use in higher education. Yet the potential Web 2.0 brings for formal higher education that is more collaborative, expressive and personalised is well worth pursuing on its own merits. The Conversational Framework proposed by Laurillard (2002) provides a useful context for applying Web 2.0 to e-learning.

It is unfortunate that technology is often taken as the starting point for innovation in education. Laurillard (2007:153), with reference to the promise of mobile devices to education, remarks

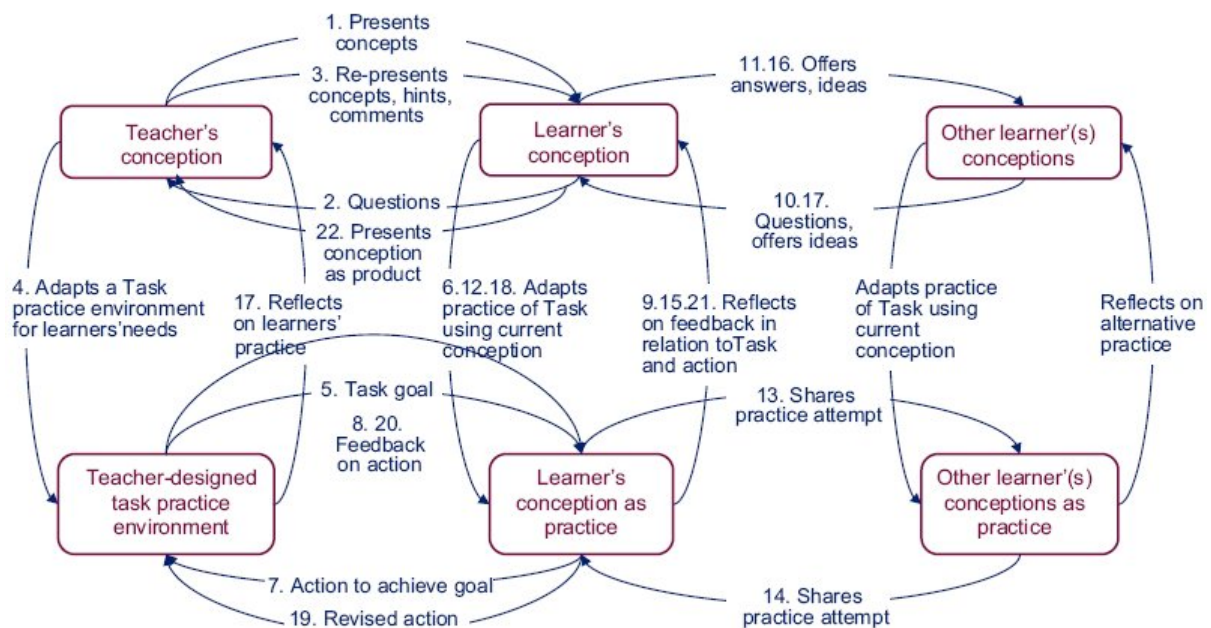
The process begins, inevitably, as a technology solution devised for other requirements, in search of a problem it can solve in education. The history of technology in education has repeated this process so many times, with less than optimal effects for education, that educators need a means by which education holds the reins of the investigation, stating our requirements, and using these to evaluate each new technology, on our terms.

And so Laurillard (2002, 2007, 2008, 2009) proposes the Conversational Framework, which portrays education as the alignment of conceptual understanding between teacher and learner as the basis for education design. Based on what is known about effective teaching and learning, the Conversational Framework provides the means for comparing different approaches to teaching and learning and the application of technology to education. The approach assumes directive teaching, discourse between teacher and student, and discourse among students themselves for the purpose of comparing and evaluating ideas. Didactic teaching, application, practice, reflection and assessment are elements of teacher/student interaction; discussion with peers provides a further dimension to the formal education experience. In Laurillard's (2002:86) words, education:

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- must operate as an iterative dialogue;
- which must be discursive, adaptive, interactive and reflective;
- and which must operate at the level of descriptions of the topic;
- and at the level of actions within related tasks.

The Conversational Framework has the teacher's own conception as the start- and end-point, as Figure One shows.



*Figure One – The Conversational Framework (Laurillard, 2009).*

The numbers in Figure One relate to the order in which successive activities might take place however, despite appearances, the Framework recognises that teaching and learning activity is more relational than it is linear. The Conversational Framework asks of any particular approach to teaching and learning (2009:19) the extent to which it motivates students to:

1. access explanations and presentations of the theory, ideas or concepts (1, 6)?
2. ask questions about their understanding of the theory, etc, by providing the opportunity for answers from the teacher (2, 3), or their peers (10, 11)?
3. offer their own ideas and conceptual understanding, by providing comment on them from the teacher, or their peers?
4. use their theoretical understanding to achieve a clear task goal by adapting their actions in the light of their understanding (5, 6, 7), or in response to comments (10, 11) or feedback (8)?
5. repeat practice, by providing feedback on actions that enables them to improve performance (5, 6, 7, 8)?
6. repeat practice, by enabling them to share their trial actions with peers, for comparison and comment (13, 14, 15, 16, 17)?

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7. reflect on the experience of the goal-action-feedback cycle, by offering repeated practice at achieving the task goal (5, 6, 7, 8, 9, 12, 19, 20, 21)?
8. discuss and debate their ideas with other learners (10, 11)?
9. reflect on their experience, by having to articulate or produce their ideas, reports, designs, performances, etc. for presentation to their peers (13, 14, 15, 16)?
10. reflect on their experience, by having to articulate or produce their ideas, reports, designs, performances, etc. for presentation to their teachers (21, 22)?

So, the Framework is “a technology-neutral way of stating the user requirements on any teaching method” (Laurillard, 2009:12), and demonstrates “the iterative cycles required for robust learning work together” according to educational theory (Laurillard, 2009:13). Diagramming a particular approach using the Conversational Framework demonstrates the strengths and weaknesses of that approach as a means of education. The goal of such learning is that the student “achiev[e] some proportion of the teacher's conception” about the subject under discussion (Laurillard, 2009:16). Feedback and dialogue are fundamental components of this conceptual alignment.

The Conversational Framework helps to identify two potential problems with the introduction of Web 2.0 tools to formal education contexts. Firstly, the Framework identifies the importance of the instructor to education. What are the implications of Web 2.0 to the instructor's role? Secondly, the Framework already identifies the importance of the learner's conception interacting with other learners' conceptions. To what extent might the conception of the individual be drowned out by those of other learners?

The role of the instructor is the fundamental question when considering Web 2.0 and its potential impact on education. The difference, though, is really one of formal versus informal learning. In a formal education context, the position of the instructor or teacher does not change; Figure One applies. However in an informal learning context, the character of 'teacher' is removed and 'the world of experience' replaces the teacher-generated environment (Figure Two). Laurillard (2007:169) remarks that “In the absence of the teacher, the learner defines their own task goal, and other learners and the world of experience act as arbiters of the learner's actions and productions”.

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*Figure Two – The Conversational Framework in support of the informal learning process (based on Laurillard, 2007<sup>3</sup>).*

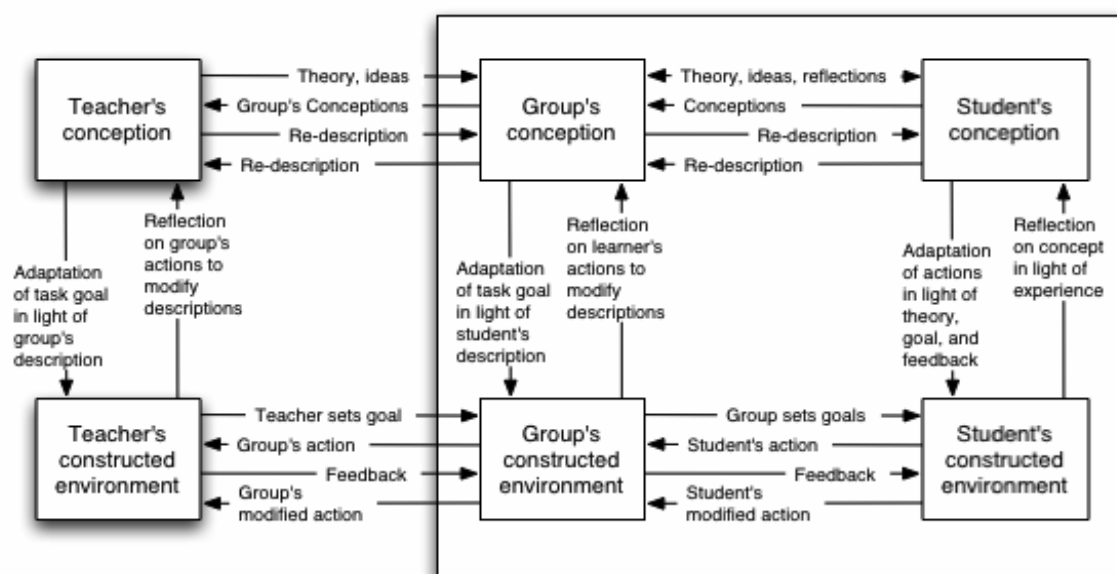
The fundamental issue when considering Web 2.0 tools for the purposes of education is which of Laurillard's Frameworks, Figure One or Figure Two, should apply. Does Web 2.0 learning require an instructor or not? Critical to the purposes of this E-Primer is the point that applying Web 2.0 tools to education should not result in alienation of the instructor, or serve to minimise their role. If the instructor is removed from the scene because a particular Web 2.0 intervention is applied we are no longer dealing with formal education, as a substantial element of the Conversational Framework is effectively removed. The 'world of experience' in Figure Two is also a setting for the creation of everyday knowledge, rather than the academic knowledge formal education is actually concerned with (refer 5.1.2, p.8).

The second problem of applying Web 2.0 tools in formal education relates to the potential emphasis on group over individual performance. While it is possible that Web 2.0 tools such as blogs and wikis in public Internet spaces have the potential for engagement with those outside the classroom (which is seldom achieved; see later discussion), discussion here rests instead with how Web 2.0 emphasises group, rather than individual, performance. To do this, we will consider the contribution of Plaisted & Irvine (2006) in their adaptation of the Conversational Framework for collaborative learning (Figure Three).

<sup>3</sup> This diagram is based on that provided in Laurillard (2007), with reference to the Conversational Framework and commentary provided in Laurillard (2009).



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*Figure Three – An adaptation of the Conversational Framework<sup>4</sup> for collaborative learning (Plaisted & Irvine, 2006:681)*

The key differences between Figure One (Laurillard's Conversational Framework) and Figure Three (Plaisted & Irvine's adaptation) are the location of the learner ('learner' in Laurillard; 'student' in Plaisted & Irvine) and, more significantly, the location of the 'group' (Plaisted & Irvine; see 'other learners' in Laurillard). In Figure Three *there is no direct feedback loop for the individual with the teacher*. Instead, conceptualisation is negotiated through the group. If a teacher is to provide meaningful feedback, the group must provide a fully representative conceptualisation of its members' varying perspectives. The contribution of the individual in a wiki or mashup is not readily apparent<sup>5</sup> and so individual conceptualisations (with all of their subtleties) are more difficult to effectively engage with by the instructor. This is highly significant, and problematic for the purposes of higher education. In Laurillard's Figure One, the teacher deals with each individual's conception directly and is therefore able to offer customised feedback to each individual. In Plaisted & Irvine's Figure Three, the teacher is assumed to have no such direct link with individual students and must instead respond to the overall group's conception. The concern here is that the 'group's conception' may not adequately reflect the subtleties of each individual's understanding, thereby reducing the

4 The title "...for collaborative learning" is at odds with Laurillard's (2009) use of the term 'collaborative'. The Conversational Framework combines 'instructionism', 'social learning', 'constructivism' and 'collaborative learning'. Laurillard (2009) has a stricter understanding of 'collaborative learning' than do Plaisted & Irvine (2006) in that Laurillard assumes a purely didactic teacher contributes in a collaborative model. It may be best to assume that Plaisted & Irvine's (2006) adaptation combines the same pedagogical models as does Laurillard, rather than to term their own model a 'collaborative' one.

5 Wikis can be checked for the contributions of individuals however it is not clear whether or not others might have made the same point as one already contributed.

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teacher's overall impact. Rather than empowering students through collaborative learning, Plaisted & Irvine's adaptation has the net effect of reducing the amount of targeted feedback provided to individuals.

Between Laurillard's Figure One and Figure Two and Plaisted & Irvine's Figure Three, there are three distinct ways in which Web 2.0 technologies might be applied to education. In all three, the learner is encouraged to articulate their conception. However Figure One places the learner at the centre, with the teacher providing a corrective conception in the form of direct teaching and feedback. Figure Two removes the teacher entirely, placing the learning in a real world or authentic context which also removes it from the sphere of academic knowledge. Figure Three places the collaborative group at the centre, and each individual's conception at the periphery. The situation is somewhat similar to that outlined in E-Primer 4.1.1; Web 2.0 can be applied to formal education in a 'cooperative' (Figure One) or a 'collaborative' (Figure Three) mode. As is clear from a comparison between Figures One and Three, a collaborative approach is likely to increase the transactional (or communication) distance between instructor and students, and influence the amount of instructor feedback able to be given to each individual.

Web 2.0 technologies accentuate the potential for collaboration, beyond turn-taking discussion posts toward collaborative resource development (wikis, mashups) and extended platforms for reflection (blogs, ePortfolios), all of which can be interconnected through RSS technology. As various eXtending tools are described in the next section, the results of studies into their implementation will help to evaluate the extent to which these technologies can, indeed, add value to teaching and learning in formal contexts.

### **5.3 *eXtending tools***

As already indicated, only a few tools are discussed in this section. Introductions to a broader range of e-learning possibilities is provided by Mason and Rennie (2008); what follows are five of the more popular eXtending possibilities for e-learning in education. Discussion begins with two Web 2.0 solutions (blogs and wikis), then proceeds to ePortfolios and MUVES (Multi-User Virtual Environments, such as Second Life). Finally, the concept of m-learning is discussed.

#### **5.3.1 Blogs**

The term 'blog' (a contraction of 'web log') is both a noun and a verb; as a noun, it indicates "an interactive web page most often used to publish regular writings on a variety of issues and with a variety of goals" (Warlick 2007:9). Blogs are "the first widely adopted easy publishing tool of the Read/Write Web" (Richardson, 2006:2), and are an excellent example

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of how Web 2.0 provides a collaborative and interactive platform. Strictly speaking a blog is not just one interactive page but a collection of multiple ones that can be displayed by date, topic or entry. A blog is like an online journal, arranged most recent entry at the top. Authoring a blog “takes as much skill as sending an email” (Richardson, 2006:17). Typically blogs are fully public and invite comments from readers. Blogs are post-centred in that their interactivity is based on each discrete entry or post. Blogs can belong to individuals or organisations, and frequently link to other blogs of interest to the author(s). Images and embedded video can be added alongside text; tags (or keywords) can also be allocated to each post, making it possible for users to quickly access related posts within the same blog. While blogs were once the domain of private individuals, use by professional journalists, corporations and teams of writers is increasingly common.

While significant numbers of undergraduate young people blog, most of them do so socially and with a focus on day-to-day life. The audience tends to be a small group of readers who are usually known to the bloggers themselves (Nackerud & Scaletta, 2008); most bloggers also “read about the same number of blogs as they have readers” (Nackerud & Scaletta, 2008:73). Oravec (2003:226) notes that the genre of the blog differs from that of online discussion boards “because of the creative leeway students are afforded as individuals”. This is a critical distinction. It is not easy to exploit the “semi-structured, creative 'middle space' that blogging provides” (Oravec 2003:228) when the focus is academic learning. The genre of free-wheeling and experimental writing in blogs (as soapboxes for opinion, accounts of experience and unprocessed thoughts between friends) makes their transferability to formal education contexts somewhat questionable. There is a distinct difference between social blogging and the expectations of educational blogging; if blogs are to be successfully used in higher education they must be more than extensions of how blogs are used by students in social contexts. Nackerud & Scaletta (2008) cite research indicating that blog writing styles tend to be determined by the writers' age and background, reinforcing the need for clear expectations and standards (see also Goldman et al, 2008 and Witte, 2007). The genre of blogging is a broad one, and students are likely to require some specific orientation to what is expected of them in terms of social and interactive behaviour (Leslie & Murphy, 2008).

Post-graduate students are more likely to blog as the “middle ground between private diary and public community” (Nackerud & Scaletta, 2008:75); indeed, blogging during a PhD is seen as a valuable contribution to helping candidates focus on writing during their research<sup>6</sup> (Ward & West, 2008). The same principles suggested by Ward & West (2008:64) might apply just as well to any research project, where a blog (or joint blog for both candidate and supervisor) is used to:

- record quick ideas, insights, reading notes, lists, useful web-links and to hyperlink these together
- store important documents (drafts, administrative materials...)

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6 Such as my own PhD candidate blog, <http://chredits.blogspot.com>.

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- record events soon after they happen (along with their emotional load) for reflection and possible later discussion with a supervisor
- ‘put ideas out there’ and receive comments, thus creating an informal international online community of practice for both product and process.

Weller et al (2005) suggest three different types of blog that might be used in higher education:

1. Group blogs – whether the group consist of students, a class with its instructor, or some other form of community of practice.
2. Academic blogs – used by instructors as outlets for ideas and up to date commentary.
3. Student blogs – used as a journal or online portfolio, and as the basis for interaction with other students.

This list serves as a general guide as to how blogs might be applied in higher education contexts. It seems that the real potential of blogging in higher education terms lies in Richardson's (2006:32) 'real' and 'complex' blogging typologies, which involve the following:

Links with analysis and synthesis that articulate a deeper understanding or relationship to the content being linked and written with potential audience response in mind (real blogging)...  
Extended analysis and synthesis over a longer period of time that builds on previous posts, links, and comments (complex blogging).

In other words, blogging is best used in circumstances where students are dealing with online content and where their analysis of that content is likely to be interesting to a particular audience, and where a blog might form an ongoing point of focus for personal expression. Reflective and metacognitive writing on its own, in Richardson's (2006:32) thinking, is complex writing but only “simple blogging”. It is the ability to link that sets blogging apart.

However, as with ePortfolios (5.3.3 below), there are various implementation issues when applying blogs in formal education contexts. Firstly, it is likely that blogs become more reflective and more attuned to a wider audience *as their authors maintain them over a period of time*. Part of the potential of blogs for formal learning rests in their ability to “support consistent, long-term individual monologues, and simultaneously allow commentary and evaluation by others” (Sharma & Xie, 2008:138). Attempting to achieve the benefits of reflective blog writing in a formally assessed way across a single semester is likely to result only in frustration for all concerned, because “the learning process is simply slower and more cumulative than that” (Nackerud & Scaletta, 2008:75). Secondly, there is the issue of ongoing maintenance of a blog created specifically for formal education purposes. Singer (2008) notes that blogs constructed for the purpose of a class are frequently abandoned once that class is completed. So, while it is possible for blogs to “serve as catalysts in stimulating critical thinking and inspiring students to be lifelong learners” (Oravec, 2003:232), there is little evidence that these longer term benefits will eventuate for students who are not blogging

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outside of the classroom context. Third, though blogs may be more popular with students than VLE discussion boards Dickey (2004)<sup>7</sup>, Kerawalla et al (2008:38) note that a blog is less formal and that “blog posts could be more detailed because, unlike a forum, reading is considered to be less obligatory”. This point is an important one, as more voluminous and less formal posts may not necessarily be useful for the purposes of collaborative academic learning or even the expression of academic learning. Sharma & Xie (2008:138) add that discussion forums are based on the concept of dialogue, whereas blogs are more individualised and have potential as a platform for “a dialogue with self”. It could be that blogs are more suited as tools for personal reflection rather than collaborative engagement, even though both Dickey (2004) and Sharma & Xie (2008) found that students perceived a reduced sense of loneliness through blogging alongside peers<sup>8</sup>.

The use of blogs might be more appropriate if they are used by instructors rather than students. Maintaining an instructor's reflective journal or maintaining a class blog can be a useful exercise (Nackerud & Scaletta, 2008). Departmental blogs might also be kept to keep readers up to date with news, and as a means of promotion. Class blogs might be configured so that the instructor and all students are able to create new entries, a particularly effective technique for engaging students further in class-related content. Students might also be directly encouraged to interact with those bloggers who are experts in the field (Nackerud & Scaletta, 2008), perhaps by:

- posting a comment that links back to their own student blog
- citing an expert's blog post in a post of their own blog, or
- assembling a 'blog roll' (a list of links) of expert blogs related to what they are studying, and requesting reciprocal listing.

Participating interactively through blogs does not require a student to create their own, as public blogs can usually be commented on by anyone.

Studies into the use of blogging in formal education contexts reveal some valuable lessons. Singer (2008) explored the use of blogs as educational tools for journalism students at both undergraduate and graduate levels, and found student blogging behaviour significantly assessment driven and strongly linked to the instructor's own blogging presence. Singer's (2008) students were on-campus ones, rather than distance students. There was evidence that only one third of students were actually intrinsically motivated by the blogging exercise, even though discourse through blog comments frequently indicated effective interaction with other's ideas. Further, of 2,578 posts and comments made on student blogs throughout the five years of the study, only *one* of note was from a true outsider to the participants. In a similar study of first-year undergraduate student bloggers, Leslie & Murphy (2008) found

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7 Dickey's (2004) study was concerned with distance education students. In the study, discussion boards were not used however a class listserv and email were.

8 In Dickey's (2004) case, the reduction of loneliness could be attributable to the small groups students were placed in, and the requirement for weekly engagement with other group members' blogs.

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that only 77 blogs of 266 had received comments from other students; of these, only 47 had evidence of affective and cohesive interaction. Only nine of these had any actual evidence of knowledge construction through interaction, probably because of a lack of instructor presence.

Goldman et al (2008) required students to use private group blogs for the purposes of assessment in a postgraduate class and found that students appreciated the way in which the blogs enabled them to learn from others' perspectives, even though there was little evidence of group community having formed (contra Sharma & Xie, 2008). In Goldman et al's (2008) study, students preferred to interact through blogs than to speak in class. However students did protest at the number of assignments (over an eight week period), and at not having enough time allocated to adequately post and comment. Overall, students appreciated the opportunity to use blogs however there was no comparison between the blogging students and a control group so that any differences in learning achievement might be measured.

So, how to make use of blogs in higher education? Singer (2008) suggests that blogging in formal education might benefit from limited involvement, yet ongoing encouragement, from the instructor so that students have more ownership for the learning process. Encouragement might include reminders to participants to regularly check one another's blogs, and drawing attention to specific posts of particular merit. Churchill (2009), in a study of post-graduate education students, demonstrates how a blog might be integrated within the design of a course. Developing appropriate learning tasks; regularly checking student posts and leaving comments; preparing weekly summaries of blog activity, and drawing attention to this in class; and making blogs an element of assessment resulted in a positive response from students. That this success meant significant involvement from the instructor is also clear from Churchill's article. Dickey (2004) was also quick to provide feedback to student blog posts, and placed students in small groups between two and six for the purposes of socialisation and weekly reflection. Researchers also recommend requiring peer interaction, otherwise feedback tends only to be provided by the instructor (Nackerud & Scaletta, 2008). Grades must also be assigned, otherwise the blogs will simply not be used; "[s]ome formal incentive does seem beneficial en route to the desired social or blended learning goal" (Singer, 2008:21; see also Williams & Jacobs, 2004). Kerawalla et al (2008), reporting on the use of blogs in a masters level distance course ( $n=9$ ) for e-learning professionals, found that students are more likely to blog if they have an audience, encounter community, and receive useful and thoughtful comments. The ability to personalise a blog is also a motivating factor for students (Leslie & Murphy, 2008). Kerawalla et al (2008:38) suggest not making blogging activities too rigid, but rather to "give the students an opportunity to explore blogging and to appropriate it to support their individual requirements".

The tension between making blogs student-directed and assessment-directed is critical, particularly as assessment causes anxiety that can make reflection artificial and not all students appreciate the same level of direction (Sharma & Xie, 2008). A lack of direction can

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be very problematic for students (Sharma & Xie, 2008), as can concerns about privacy for those required to blog in public spaces.

Many commentators have noted a lack of research into blog use in higher education. Goldman et al (2008:1662) remark that further research is particularly necessary in the areas of

criteria for grading discussion, including criteria for grading participation, desirable and effective incentives for participation, finding the balance between the requirement to participate and the freedom to choose to participate, and balancing the need to preserve privacy of participating students and the desire to facilitate students' interactivity.

This remains an important list. The helpfulness of comments (particularly whether they provide a useful critique) is another matter worth further study (Leslie & Murphy, 2008), as is further research on how to encourage meaningful reflection through blogging in formal education (Sharma & Xie, 2008). Finally, research comparing the outcomes of a blogging and a control group, measuring across different forms of learning, will fill a much-needed gap in establishing blogging's true potential to formal learning contexts.

Free and hosted blogging tools include Blogger (<http://www.blogger.com>), LiveJournal (<http://www.livejournal.com/>), Edublogs (<http://www.edublogs.org/>) and Wordpress (<http://wordpress.org/>). Edublogs provides an additional campus service (for a fee), giving the options of institutional domain names for blogs, additional privacy settings, and various account management options. Wordpress can also be installed on a separate server, enabling a user to host their blog under their own domain name. Movable Type (<http://www.movabletype.org/>) is an open source platform for those wanting to set up their own blogging service. Most VLE systems also have in-built blogging tools.

### **5.3.2 Wikis**

A wiki is a means for online collaboration consisting of a Web page (or series of linked pages) that can be conveniently viewed and revised by multiple users. Earlier versions of each page can be compared and restored at any time, so it is possible to trace the journey of a wiki's construction over time and to reinstate earlier work. New pages can be created and linked to, and each saved contribution can be checked according to the time it was added and who added it. A wiki is always a dynamic work in progress, relying on its contributors to keep it up to date and accurate. The versatility of wiki applications is such that the open learning sites for Wikiversity ([http://en.wikiversity.org/wiki/Wikiversity:Main\\_Page](http://en.wikiversity.org/wiki/Wikiversity:Main_Page)) and Wikieducator ([http://www.wikieducator.org/Main\\_Page](http://www.wikieducator.org/Main_Page)) are based entirely on wiki technology.

The most common example cited of wikis in use is Wikipedia, the online encyclopedia that

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can be edited by any Internet user. The empowerment wikis provide to users is put well by Richardson (2006:60):

So, you have some knowledge about your favourite hobby that isn't on Wikipedia? Add it. Read something you think isn't correct? Fix it. Don't like the way one of the entries is written? Erase it. Something big just happen in the news that is history making? Start a new entry. You have the power, because every time you access Wikipedia or most any other wiki for that matter, you do so as Editor in Chief.

This sharing of editorial power has its challenges. In a highly publicised (and contested) comparison between Wikipedia and Encyclopaedia Britannica, *Nature* magazine reported that Wikipedia articles were frequently poorly constructed and confusing. Further, and more significantly, in a selection of articles it was assessed that there were 123 mistakes in Encyclopaedia Britannica and 162 in Wikipedia. Britannica has contested the findings, and based on its own critique (Encyclopaedia Britannica, 2006) the disparity may well be greater. Supporters of Wikipedia are quick to note that the errors in the Wikipedia articles were very quickly corrected. Larry Sanger, co-founder of Wikipedia, became so concerned over the alienation of experts in the Wikipedia system that he started an alternative online encyclopaedia, *Citizendium* (<http://citizendium.org>). Citizendium aims to improve the reliability of information through the use of “gentle expert oversight” and the use of real names by contributors (Citizendium, nd) however its entries numbered 957 as at 17 June 2009, compared to the 2,916,846 English articles available in Wikipedia on the same date. The example of Wikipedia establishes wikis as environments “in which information is seen to be fluid and flexible, and even more importantly, communally constructed and owned” (Mason & Rennie, 2008:66). it is important to differentiate between community ownership and a sense of community; Hemmi et al (2009) found that students perceive a wiki to be a more formal and disciplined place for sharing ideas than in a discussion group, but also less of a 'community' space.

Shared editing provides substantial opportunity for collaboration in higher education. A wiki could be used to pool the knowledge and perspectives of groups of students, forming not only a useful learning resource but also requiring students to apply the skills of critical reading, reflection, evaluation, and writing (Trentin, 2008). Students who know that they are writing for one another are motivated to be accurate and relevant in their contributions (Wheeler et al., 2008). Having groups of three to four prepare an article on a particular topic is a simple way of using wikis in higher education (Choy & Ng, 2007). Wikis can also be used as gathering points for online resources, brainstormed ideas, or a series of interlinked reference materials. Such resources might be maintained across different class cohorts. A wiki might be used as a dynamic information page across the duration of a course, combining class news with the latest articles or ideas relevant to the course. Editing rights to a wiki might or might not be restricted to the members of a class; indeed, class groups might also be required to evaluate and update entries in Wikipedia itself, perhaps with reference to the 'history' and 'discussion' pages associated with each entry. Mason & Rennie (2008:68) suggest an exercise



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where students are required to “think about how information is organised, especially in a large or complex area, and to consider how to present it in small, hyperlinked chunks”.

While wikis are ideal for online group collaboration, Wheeler et al (2008:990) caution that “it is inevitable that some students will contribute more content than others”. Further, the anonymity and emphasis of the group output over each individual's contribution is not always appreciated by students. Though public resources such as Wikipedia celebrate the collective outcomes of collaboration, “[i]n classroom contexts, where students are familiar with each other, ownership appears to be an issue” (Wheeler et al, 2008:992). The concern of ownership highlights again the contrast between Laurillard's (2009) and Plaisted & Irvine's (2006) differing versions of the Conversational Framework: to what extent is the understanding of the individual hidden behind the processes of the wiki? Could using a wiki hinder the provision of effective feedback to individuals, particularly those whose perspectives may or may not be adequately represented in a series of wiki pages? Wheeler et al (2008:993) also observed that students tended to just read those pages that they themselves were actively editing, which served “to negate the original objective of collaborative learning through content generation”. Wheeler et al (2008:994) conclude by saying:

Transferring some assessment activities to a shared, collaborative space such as a wiki would raise a number of issues of quality, authenticity and plagiarism. The problem of equitable marking of individual work would also require further thought, given the shared and public nature of the wiki.

Fortunately, it is possible in formal education to achieve the collaborative benefits of wiki development alongside valid forms of assessment. Trentin (2008) outlines a process by which it is possible to evaluate both the collaborative wiki and individual contributions. Having each student take ownership for a discrete section of the overall wiki provides the basis for assessment. Part of preparing a discrete section involves linking it to others in the wiki, requiring students to browse across the entire series of wiki pages. Trentin (2008) also requires peer review comments across the entire wiki (peer review comments are provided as comments, rather than direct edits on the page). Students make use of the peer review comments to improve their own sections. Each student's contribution can ultimately be assessed according to their particular section (in terms of its own integrity as well as how well it is linked to other parts of the overall wiki), with each individual's peer review activity also considered. Peer evaluation can also be conducted to assist with an individual's final grade. All of this, of course, suggests a 'due date' by which the wiki will be evaluated.

It is clear from literature the effective use of wikis in higher education requires clear instructions, user training, and recognition of the time and effort wiki construction demands (Choy & Ng, 2007). Instructions should include not just the technical details on how the actual wiki application works, but also about the need to approach the wiki from a collaborative, rather than competitive, orientation (Wheeler et al, 2008). Establishing style guides for writing and editing is also useful (Trentin, 2008). Authentic and small, well-

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defined tasks seem a promising use of wikis in formal education (Bower et al 2006, in Choy & Ng, 2007). While it might be beneficial to assign roles (such as editor) within wiki groups (Richardson, 2006), this can have the effect of over-burdening particular group members (Trentin, 2008).

As with all Web 2.0 tools, a variety of wiki applications are available to higher educators. Learning Management Systems such as Blackboard and Moodle have their own internal wiki tools. External applications such as Writeboard (<http://www.writeboard.com/>), PBwiki (<http://pbwiki.com/>) and Wetpaint (<http://www.wetpaint.com/>) permit anyone to create and manage a hosted online wiki, either open to anyone or passworded for invited members. MediaWiki (<http://www.mediawiki.org/wiki/MediaWiki>), the application used as the basis for Wikipedia, Wikiversity and Wikieducator, is a free application that can be downloaded for installation on any server. Subscription-based online office suites such as Google Docs (<http://docs.google.com>) and Zoho (<http://www.zoho.org/>) permit collaborative editing and version control of documents that are fully word-processor compatible.

Wikis are very flexible tools that reward creative and well constructed learning tasks. As with all collaborative tools, it is crucial that the time required for effective collaborative work is recognised and factored into course workloads (Chay & Ng, 2007). Requiring students to participate in developing a wiki demands a significant effort from them, and so represents a serious pedagogical undertaking.

### **5.3.3 ePortfolios**

An ePortfolio is defined on Wikipedia as

a collection of electronic evidence assembled and managed by a user, usually on the Web... E-portfolios are both demonstrations of the user's abilities and platforms for self-expression, and, if they are online, they can be maintained dynamically over time. Some e-portfolio applications permit varying degrees of audience access, so the same portfolio might be used for multiple purposes.<sup>9</sup>

ePortfolios are essentially digital versions of more traditional hole-punched and ringbinder portfolios; electronic portfolios are considerably more flexible, more easily revised, and can be made available to wider audiences<sup>10</sup>. Several ePortfolio typologies exist, such as this from

- 9 The substance of this definition was proposed by me in 2007, and it is still largely intact. The definition by Sutherland & Powell (in JISC, 2008 p.7) is another excellent one: "An e-portfolio is a purposeful aggregation of digital items – ideas, evidence, reflections, feedback etc, which 'presents' a selected audience with evidence of a person's learning and/or ability". Comparing this definition with that of Wikipedia demonstrates the issue raised by Mason & Rennie (2008, p.73) that "There is still lack of clarity about whether the term *e-portfolio* refers to the software, a particular presentation or all of the contents".
- 10 Traditional portfolios have the advantage of tangibility however even here electronic portfolios are still useful. Digital images can be included as evidence of physical artifacts.

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Abrami & Barrett (2005):

- The process portfolio, showing the owner's learning journey over time;
- The showcase portfolio, showing the owners' actual achievements; and
- The assessment portfolio, for demonstrating achievement for formal learning purposes.

It is also possible for an ePortfolio to serve as the basis for social networking (see Tosh & Wermuller, 2004). However in education contexts students are frequently given the objective of forming a process, showcase or assessment ePortfolio (perhaps according to a graduate profile). An ePortfolio essentially enables users to assemble various digital artifacts (any digital file, including those already available through online services such as Flickr, YouTube and blog services), store and organise them using keywords (tags), and make any combination of those artifacts available to various audiences (see Figure Four).

So, constructing an ePortfolio broadly requires the user to “reflect, select, connect, project” (Conrad 2008:143). The user will reflect on the purpose of their ePortfolio and the pool of artifacts they have available, select or create those that will best meet that purpose, connect the artifacts in such a way that demonstrates achievement, and project the resulting presentation for others to see. Many ePortfolio tools enable the matching of artifacts to audiences in ways completely determined by the user.

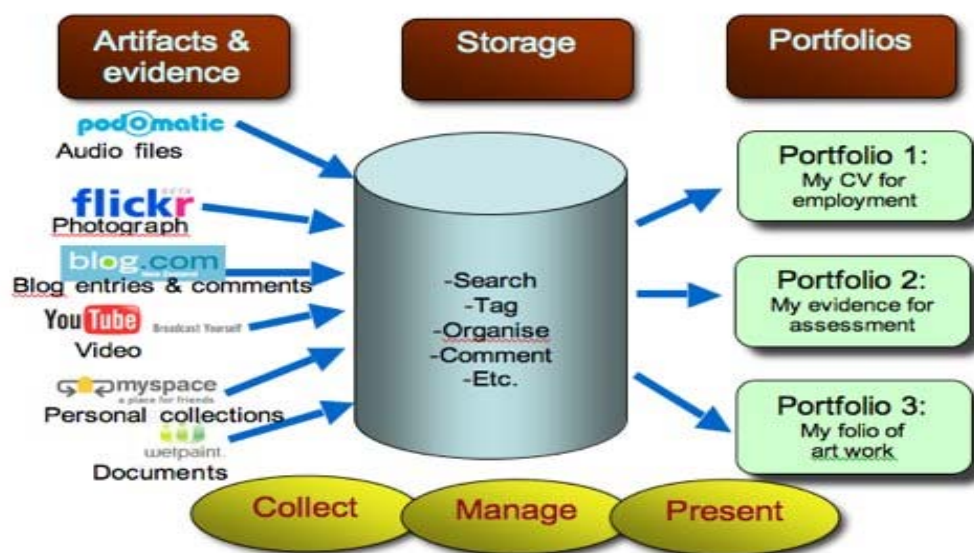


Figure Four – Matching audiences with artifacts (from Derek's blog, [http://blog.core-ed.net/derek/files/2008/09/portfolio\\_diag1.jpg](http://blog.core-ed.net/derek/files/2008/09/portfolio_diag1.jpg))

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The case study accounts in works such as Jafari & Kaufman (2006), Cambridge (2001), Stefani et al (2007), JISC (2008) and AeP (2008) demonstrate that the use of ePortfolios in education is extremely varied, both in the types of courses they are applied to and in what is expected of students. While this indicates the versatility of ePortfolios, it is also evidence that ePortfolio use in higher education is, at present, somewhat fragmented and characterised by “considerable exploratory use” (AeP, 2008:133). It is well demonstrated that ePortfolios have considerable potential as tools for assessment (Stefani et al, 2007) and for recognition of prior learning (Conrad, 2008). Preparing an ePortfolio has been termed an exercise in “assessment *for learning*” as well as assessment of learning (Chambers & Wickersham, 2007:351).

In a review of literature, Butler (2006:19) writes

To be successful users of electronic portfolios, students need to understand the reasons for constructing a portfolio, be given clear guidelines, and have access to an electronic portfolio system that is easy to use and gives them as much flexibility or as much structure as they require. They also need the support of their lecturers. Academic staff need to be committed to the portfolio process, and willing to give students regular and useful feedback on their work and reflections.

Lane (2007) conducted research into how students perceived ePortfolios, and reported on three main findings:

- students’ base their understanding of ePortfolios on prior experience with other online tools, including social applications such as Facebook and MySpace
- knowledge of the intended audience is key for ePortfolio creators
- visual and Web design skills are critical.

Lane’s findings indicate that unless a particular genre or objective is clearly communicated to students, they will tend to consider ePortfolios as an informal means of self-expression. Chambers & Wickersham (2007:354) demonstrate that integrating the requirements for student ePortfolios firmly within the programme of study, improving student efficacy and enhancing student “involvement and sharing of the ePortfolios” improves both student learning and their sense of ownership. Lumsden (2007) shows that a large-scale implementation of an ePortfolio across an institution can work if it is deliberately student-centred, well supported, and strongly linked to educational and career-planning outcomes. Wetzel & Strudler (2005) also found that broad-based planning, a clear purpose for ePortfolios, incremental implementation, and training are important factors of success. Providing feedback on student ePortfolios also serves to enhance their value in students’ minds (see, for example, Gülbahar & Tinmaz, 2006).

ePortfolios can be used as a central hub of evidence for learning. One way of achieving this is to require students to demonstrate they have achieved various learning objectives through

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providing sufficient artifact evidence. Another way is to have students demonstrate how they have integrated the various learning outcomes of a course (Mason et al, 2004).

An ePortfolio could be as simple as a PowerPoint presentation on CD-ROM . Early literature portrays ePortfolios as static Web pages, sometimes made available through an institutional intranet (see for example Cambridge, 2001). With the emergence of Web 2.0 and specific ePortfolio platforms that make ePortfolio creation more convenient, the static web page approach can be considered passé. Many ePortfolio platforms do more than simply store, manage and display artefacts. Some include blogging tools, group and social networking functions, and features that make them viable alternatives to learning management systems and the use of Web 2.0 applications such as MySpace or Facebook. Some applications permit RSS feeds to be included in portfolios; others permit grouping and the ability for others to add comments on particular ePortfolio presentations. Some allow templates for ePortfolio production; others are based on a competency or skill matrix, to which users attach artifacts as evidence that they have achieved those competencies. Finally, some platforms (such as Mahara) facilitate the generation of multiple ePortfolio versions at once to multiple audiences, all drawing on the same pool of artifacts.

There is a broad selection of dedicated ePortfolio applications. Open source solutions include Mahara ([<sup>11</sup>](http://mahara.org)), ELGG community software (<http://elgg.org/>), and OSP (<http://osportfolio.org/>). Commercial options include ePortfolio, (<http://www.eportfolio.org/>), PebblePad (<http://www.pebblelearning.co.uk/>), ePortaro (<http://www.eportaro.com/>), and iWebfolio (<http://www.iwebfolio.com/>). Many learning management systems (such as WebCT) include their own ePortfolio tools. The choice of application is significant, because it determines where the application is hosted, what fees to account holders apply, whether student portfolios can be made available outside the institution, and whether or not students can use their ePortfolio beyond the completion of their studies. While inter-operability standards are emerging through various initiatives (AeP, 2008), they are not yet broadly adopted. It is suggested that ePortfolio applications be assessed based on the extent to which they enable flexibility to the user, and provide sustainable access across time. If ePortfolio use in higher education were characterized according to three binary criteria, short-term or long-term, formal or informal, autonomous or coerced, most educationally-initiated ePortfolio activity would be short-term, formal and coerced. While ePortfolios have considerable potential as personalised and reflective learning tools (JISC, 2008), they are frequently used in formal education contexts in a stand-alone way. There is a tendency in ePortfolio literature to consider ePortfolios solely in an educational setting. Cambridge (2001) places student ePortfolios firmly in the context of assessment. Lambert & Corrin (2007) talk of implementation based on the graduate profile. Lane (2007:np) draws a sharp distinction between social spaces and “academic and professional Web spaces”.

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11 I chaired the development of Mahara while at Massey University; it has established itself internationally as an ePortfolio system of choice. It was designed to be flexible, scalable, and viable as the basis for a user's lifelong Web presence. For one evaluation report, see Cox et al (2008).

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If an ePortfolio system is adopted for the purposes of formal education, it is strongly suggested that it be implemented in ways congruent with lifelong learning. Providing an 'ePortfolio for life' is the goal of many governments and agencies. Both the Learning Innovations Forum d'Innovations d'Apprentissage (LIflA) and the European Institute for E-Learning (EIFE-L) are pursuing the goal of an ePortfolio for every citizen (in the Americas and European Union respectively) by 2010. The goal is one ePortfolio for life for each citizen (Barker 2006). The Department for Education and Skills (DfES) has also set specific actions relating to ePortfolios in the UK linking them strongly to lifelong learning (DfES 2005). Considerable work is being done by the JISC (see for example Beetham 2005; Gray 2007) and other agencies (AeP, 2008) to ensure that ePortfolio tools and systems are considered in a lifelong context.

### **5.3.4 MUVEs and Second Life**

An MUVE (Multi-User Virtual Environment) is an online setting where people can meet and interact. The term applies to Massive Multiplayer Online Games (MMOGs, such as *World of Warcraft*) as well as virtual environments such as Second Life. While there are other MUVEs that might be used for educational purposes, Second Life is an advanced and well-established environment that attracts the most interest from educators (Kelton, 2008; Salmon & Hawkrigde, 2009; Salt et al, 2008; Warburton, 2009). eSchool News (2007, np) describes Second Life as “Barbie, Ken, and hundreds of their clones dropped into the world of The Matrix.”

Second Life is described by Linden Research Inc., the company that owns and facilitates the Second Life MUVE, as “a free online virtual world imagined and created by its Residents”, a “fast-growing digital world filled with people, entertainment, experiences and opportunity” (Linden Research Inc., np). Second Life is not, strictly, a game. What occurs in the Second Life setting is entirely open-ended; “there is no natural purpose unless one is created or built” (Warburton, 2009:416). Members can even own and customise virtual real-estate. User accounts are free however 'land' in the virtual environment must be purchased. A virtual currency, the Linden dollar (purchased using real money) facilitates virtual services in world. According to Wikipedia, as of September 2008 there were some 15 million registered Second Life accounts internationally. On 1 April 2009 at 6:26pm PDT there were some 70,000 users online with some 1.5 million accounts having been active across the preceding 60 days. Of these users, some two-thirds are likely to be in the age group 25-34 (Berge, 2008). Users of Second Life are represented in the MUVE by avatars, three-dimensional characters that can be highly customised with dress and physical characteristics. Users can choose to be completely anonymous, form communities, and communicate through synchronous voice or text chat. The environment itself has benefited from considerable activity by its Residents, who have purchased land and developed a multiplicity of environments and simulations for

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avatars to experience. Many companies have virtual presences in Second Life, though more recently these have been downsized or even abandoned (Semuels, 2007).

Second Life has generated a great deal of interest in higher education circles and so provides an excellent case study for the potential of MUVES to formal education. Rich simulation areas can be found for archaeology (see Edirisingha et al, 2009), architecture, drama, language learning, fashion, history, archeology, science, geography, art, meteorology, programming and tourism – among many others. Innovative educational uses include role plays, problem-based learning, action learning, building objects, dramatic theatre and other forms of experiential learning (see Molka-Danielsen & Deutschmann 2009 for a collection of innovative educational uses). Machinema, or virtual cinema recorded in Second Life, can also be used to help illustrate real-world scenarios (Middleton & Mather, 2008); the development of machinema becomes in itself an exercise in cinematography. Virtual museums provide three-dimensional representations of real museums. One simulated area exposes visitors to what schizophrenics experience in their real life interactions with the world. Communities meet for special event presentations and discussions. Multimedia (video clips, slideshows, audio recordings) can be made available 'in world', and users (through their avatars) can talk and type about their learning. The International Society for Technology in Education (ISTE) maintains an educational portal of sorts in Second Life. Koru Island is a destination hosting various polytechnics and the SLENZ (Second Life Education in New Zealand) project (<http://slenz.wordpress.com/slenz-project/>), funded by the Tertiary Education Commission to “delineate and demonstrate to New Zealand educators and students the educational strengths or otherwise of learning in a virtual world” (SLENZ, np).

The difficulty of finding objective evaluations of education in Second Life is acknowledged by Salt et al (2008:8):

Almost all educational work in this field is less than two years old and very little has yet been published in established journals...much of the literature around the educational use of MUVES in general, and Second Life in particular, is coming from the group of educators at the forefront of the experiment and who, not expectedly, have an inherent belief in the value of what they are doing.

However some objective studies from enthusiasts are emerging. Recent issues of the journals *ALT-J* (16[3], 2008) and *BJET* (40[3], 2009) were dedicated to MUVE (primarily Second Life) use in higher education. In terms of the Community of Inquiry Framework (E-Primer 4.3.1) a study by Omale et al (2009:4932) concluded that MUVES can certainly enhance social presence but, in their study, “did not contribute greatly to participants' cognitive presence”. It seems that Second Life has great potential for generating social presence, and potential to improve learning mainly as it relates to artifacts in the learning environment (Edirisingha et al, 2009). Another study (Vogel et al, 2008) compared Second Life with other means of online collaboration for educational purposes. Despite an attractive and engaging virtual location (a ski resort complete with timed slalom course), Second Life was rated

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least in terms of perceived usefulness, ease of use, team attitude, and intention to use when compared with MSN (synchronous text messaging), asynchronous online forums, videoconferencing, and email. On the other hand, Second Life did rate highly for 'fun'. According to Vogel et al (2008:20), the interface and bandwidth were significant barriers to students, and the Asian value whereby “work and play do not mix” of the sample itself might also have further skewed responses. Other studies (such as those by Molka-Danielsen, 2009 and Jægar & Helgheim, 2009), confirm little more that Second Life has 'potential' and that it requires significant technical literacy from users. Molka-Danielsen's (2009:23) evaluation found that many students “had spent hours in trying to get it to work”. An account in Berge (2008:30) describes the issue well:

Navigation is pretty hard at first in SL. In fact, everything is hard in *SL* the first time or two... or twelve... I am not a techie or programmer. I am not a gamer. If I had a background and familiarity with either or both of these skill sets, I could probably manage to get by in *SL* with a couple dozen hours of practice and play... when I found some educational locations, they were essentially empty of content and people. I went to many and found myself isolated, frustrated, and disappointed – another couple of hours down the drain.

At the time of writing, the value of Second Life as a *comprehensive* education solution is highly questionable. While the sense of being 'immersed' in Second Life can be “compelling” for users (Warburton 2009:419), the bandwidth and computer processing required for in-world experiences can result in considerable lag – resulting in a frustratingly stuttered and jerky sense of movement and orientation. While synchronous discussion is possible in Second Life, the predominance of text-only chat also stifles communications; Edirisingha et al (2009:472) note that “[c]ommunication in SL... involves a kind of choreography”. As Salt et al (2008:6) note, Second Life “is unlikely to entirely replace other forms of delivery and it is best seen as an adjunct to both face-to-face teaching and other online applications”. Work on integrating Second Life with Moodle (the Sloodle project, Livingstone et al, 2008) will assist with this connection.

It is difficult to disagree with Berge (2008:30-31), who writes:

It is entirely possible, perhaps probable, that as SL evolves and matures, the current drawbacks will become less pervasive and less important, or that the current version of SL is a stepping-stone to something else that will be less cumbersome. Regardless, until educators figure out what to do in 3D virtual environments that cannot be more easily done in real life... educators in these virtual metaverses are relying on novelty and social presence to carry the day. I doubt it is enough after the initial experimentation for either students or faculty. Still, it is too early to dismiss the potential, and worth seeking to understand education, teaching, and learning in emerging virtual worlds.

Salmon & Hawkrigde (2009:403) echo Berge's conclusion:

It may be too early to be sure that 3-D MUVE's are more than a flash in the pan for higher



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education: after all, plenty of other technologies have been used for education for a few years only to disappear.

While it is certainly true that distance learning students in Second Life cannot 'lurk' (Mason & Rennie, 2008) and can participate in rich simulations, it is unlikely that Second Life will be a viable means for higher education until its various usability problems are reduced and bandwidth access increases (still an issue in New Zealand). At present its value-add is confined to the (virtually) experiential, making it an attractive option for assisting learners to develop knowledge where simulated reality is not a barrier, or where simulation gives a distinct advantage. While conversation can also be facilitated through Second Life, it is uncertain whether its synchronous nature and virtual setting provide any real advantage over alternative (and asynchronous) means. However, once MUVE options become more accessible, it is not difficult to imagine a single, avatar-based interface that facilitates a dialogue-based, resource-rich and (a)synchronously flexible education experience where collaborative group work, presentations, and didactic teaching can be introduced alongside opportunities for simulation. Cormier (2009) suggests that instructors soon see the possibilities of Second Life once they become familiar with it themselves.

### **5.3.5 M-learning**

Mobile learning involves the use of mobile technologies for educational purposes, so is based on technological hardware more than specific pedagogical possibilities. Price (2007:33-23) defines m-learning as “the use of handheld technologies enabling the learner to be 'on the move', providing anytime anywhere access to learning”. For training purposes, the promise of ten-minute bites of linear learning time leading to completion is a promising one (Vanthournout & Koch, 2008), making possible the mantra 'just in time, just enough and just for me' (Rosenberg 2001 in Peters 2009:114). However for the purposes of academic learning m-learning's usefulness is more complex.

Mason & Rennie (2008:117) remark that “cell phones, personal digital assistants (PDAs), MP3 players, portable game devices, handhelds, tablets and laptops”<sup>12</sup> are included in consideration of mobile devices, which at once makes clear the diversity of potential. While there is certainly convergence of device taking place (for example, mobile phones that run computer operating system software, computers with mobile internet access), the ability to create content, play multimedia and access the Internet cannot be taken for granted when considering m-learning. It is also important not to exaggerate the ways in which convergence are taking place, as devices still maintain a clear sense of genre and frequently do not have all of the features that represent a true convergence of mobile technologies. The key differences relate to mobility (as in portability) and connection to a mobile network (as opposed to a wireless network). Key features of mobile devices include:

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<sup>12</sup> Traxler (2009) excludes tablets and laptops on the grounds that they are not habitually carried around.

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- Cellular network capability (traditional mobile phone; can include SMS and Internet access through WAP<sup>13</sup>).
- Wireless network capability (computers and PDAs; access to full Internet services through WLAN<sup>14</sup>).
- Multimedia playback, for digital video and audio.
- Multimedia recording, for video and audio.

A net book, or ultra-portable computer, will typically be a fully featured laptop that lacks an optical drive (for example, the Acer Aspire One). A typical net book computer can run standard computer applications, record and play back multimedia, and connect to the Internet wirelessly – but cannot be used as a mobile phone through a mobile network<sup>15</sup>. A PSP (Playstation Portable) is a portable games console that can be wirelessly connected to the Internet (and even used for Skype calls), play back multimedia, and store digital multimedia files. However it does not have mobile access to the Internet (via a cellular network), lacks easy text input, cannot be used for SMS and cannot record (<http://www.us.playstation.com/PSP>). An iPhone (<http://www.apple.com/iphone/>), on the other hand, provides a full mobile phone and portable computer combination that includes wireless and mobile Internet access, an on-screen keyboard, and digital camera and voice recording functions. For the main, while almost everyone has a mobile phone, not everyone has access to the range of potential features available in an iPhone. The diversity of device features (with normal cell phones more popular than PDAs), limited screen size, poor keyboard interface and the expense of cellular network traffic are some of the technical issues that hinder m-learning. Poor sound is also often mentioned (Kulkuska-Houme & Pettit, 2009; Naismith & Smith, 2009).

'M-learning', then, might include the use of classroom response systems (wireless units used by classes of students to rapidly answer multiple choice questions) right through to collaborative data gathering by students at different locations (Roschelle, 2003). It can also include the use of mobile devices as content repositories, and as personal organisers through use of their calendar, contacts and to-do lists (Corlett et al, 2005). Case studies in Faux et al (2006) also demonstrate the potential for mobile devices to interface with class projectors and interactive whiteboards, creating more flexible possibilities for lecture periods. Shen et al (2008) demonstrate the viability for live lectures with opportunity for student response to be broadcast to mobile devices. Flash-based content can also be used by PDAs able to run Flash Lite software, creating opportunities for self-paced learning (Bradley et al, 2009; Naismith & Smith, 2009).

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13 WAP (Wireless Application Protocol) tends to be somewhat limited to basic web pages. Multimedia and Internet applications requiring special player software tend not to be usable.

14 A WLAN (Wireless Local Area Network) differs from a WAP in that WLANs are designed to support wireless computer networks.

15 Skype can be used for sending SMS messages wirelessly and for calling mobile phones, but not for receiving either.

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Depending on the device, mobile learning can be applied to supplement classroom or field trip activities (Price, 2007), improving communications between groups, making information available “whenever and wherever learners need it” (Lai et al, 2007:328) during a fieldtrip exploration. In Lai et al's (2007) study, students used mobile devices to record observations, photograph samples and share results. The study made use of a control group and found that students who used PDAs for notetaking during a field trip generated more notes, and had a slight edge in terms of knowledge acquired. Of concern however was that students with PDAs were less likely to rate the sensory experience of the field trip highly. Despite taking more notes, students “with PDA in general lost interest in engaged observation” (Lai et al, 2007:335). Cavus & Ibrahim (2009) found that English language students who were sent technical vocabulary to their mobile phones via SMS reported it as very successful, though no comparison study was made with students who were not sent SMS. Rekkedal & Dye (2009) provided PDA-based mobile technologies successfully to increase flexibility of study for their students (which numbered less than ten in any case), and Wishart (2009) in a ( $n=12$ ) study of teacher trainee students found that they were more likely to use PDAs for note-taking (including multimedia recording), internet access and as calendar scheduling rather than for collaboration.

Seppälä & Alamäki (2003) describe a mobile learning project that involved giving teacher trainees mobile devices (mobile phones and digital cameras). Students were required to use SMS (Short Message Service) and MMS (Multimedia Message Service) to share brief teaching insights and digital photos (with SMS captions) of their supervision experiences. The use of mobile phones also enabled the course instructor to “reach all students even when they are physically scattered in different locations” (Seppälä & Alamäki 2003:332). Students reported positively in terms of the convenience, expediency and immediacy of their experience. Instructors used SMS to provide immediate feedback. Students were provided with the technology they needed. While this example is extremely positive, the class size ( $n=11$ ) must be borne in mind as such an approach may not be scalable across larger class sizes. Cook et al (2007) required business studies students to gather video clips and photographs, and also respond to various questions posed via SMS, for an assignment. Mobile phones were provided ( $n=12$ ). Cook et al reported high levels of student engagement, and a positive response to the various reminders sent to students by SMS however students were not so eager to be able to access learning materials via their own mobile devices (36% of respondents were generally positive toward the suggestion; 55% were neutral toward it). A clear majority of respondents (82%) were positive about being contacted for learning purposes via their own mobile phone. An online repository formed the focal point for multimedia files in both the Seppälä & Alamäki (2003) and Price (2007) case studies. Corlett et al (2005) found that students appreciated the opportunity to use mobile devices as personal organisers and as content repositories however gains in cognition were not measured. Participants were also reluctant to customise and extend the features of the devices they were loaned ( $n=17$ ), and some experienced technical difficulties. Most found battery life to be a

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significant problem. There some is evidence that enhancing experiential learning through the use of mobile devices improves cognition.

The main use for deliberate m-learning for traditional mobile phones seems to be sending SMS reminders of key facts, reflective questions, and course notices. Beyond this, m-learning can provide student convenience depending on the features in their own mobile devices. Portable multimedia review, multimedia recording and mobile Internet access can significantly add to student convenience. Students with mobile access to the Internet (and a device capable of easy text input) are able to participate in blogging, ePortfolio maintenance, and LMS activities and resources as regular parts of Internet use.

The recommendations of Faux et al (2006) are useful:

- make use of handheld (mobile) devices in ways that integrate with other technologies and learning strategies.
- have “an authentic purpose for use of the devices” (p.2)
- have deliberate learning goals, even if these are “as much about the culture of learning as about specific content or skills” (p.2)
- use them for “those particular activities with are appropriate for their use” (p.4)
- try to take advantage of the devices' abilities to replay and generate content.

A BECTA project investigating the use of mobile devices in schools suggests that “Mobile devices are best seen as an additional tool for learning” (McFarlane et al, 2007:15). The 2008 interim report is also tentative, with evidence gathering still taking place. Early indications are that students are benefiting from the use of mobile devices, and that teachers are discovering more innovative and useful means of using the devices for educational purposes. Frequently, the mobile PDAs in McFarlane et al are used as an element of a task rather than the sole means for completing a task. The network and technical support problems experienced in the large scale rollout have been significant. The 2008 report concludes that “mobile devices can make a very positive contribution to teaching and learning” (MacFarlane et al, 2008:24), adding that “[t]he main policy issues to be addressed are of sustainability and scalability”.

Depending on their features, mobile devices can be used to:

- record lectures
- record presentations by students, giving them opportunity to learn from their own performances
- photograph examples
- provide verbal or video messages as formative feedback
- provide access to course notes, which might include multimedia and self-paced modules
- facilitate communications

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- interact with Learning Management Systems and online services.

Besides their obvious uses for mobile phone calls and as personal organisers, it is increasingly common for mobile devices to be used successfully for such things as patient files and medical reference materials (Kenney et al, 2009), training records, maintenance references and engineering instructions, project management devices, and a very broad range of additional uses in industry settings (Peters, 2009). In formal education, mobile devices can also enhance the flexibility of anytime, any place learning which can be lost when paper-based distance education moves to online resources, requiring students to sit with computers (Rekkedal & Dye, 2009). A useful framework for implementing m-learning is provided in Koole's (2009) FRAME model.

## ***5.4 Designing for eXtended tools***

From time to time a tension between student and institutional control has emerged as an issue in the analysis above. The longevity of student accounts is a clear issue with ePortfolios and blogs, both of which would seem to work best in a lifelong context. In their natural habitat, Web 2.0 tools place the user at the centre of their own collaborative experience; formal education, with its more structured context and requirements for assessment, is not well positioned to facilitate this. There is an inherent mismatch between Web 2.0 tools and formal education, as described by Hemmi et al (2009:29):

The volatile modes of online interaction enabled by the new social media perhaps sit uncomfortably within existing higher education practice. The communicative landscapes opened up by social media can be spaces of strangeness and troublesomeness to the academy, both epistemologically and ontologically... They entail a shift towards new, volatile forms of textual mediation and subject formation and place increasing emphasis on collaborative modes of enquiry and the importance of group self-regulation and self-explanation. They have the potential to alter relations between process and artefact, permit fragmentation over cohesion, exploration over exposition and the visual over the textual. They are characterized by a tendency towards endless re-crafting, often involving rapid patterns of amendment, truncation, revision and addition. They are perhaps a product of speed... and fast time..., operating through trust and consensus, whereas the cloistered, analogue academy has required slow time, reflection and reference to authority and the authoritative. In the courses and programmes of study considered during this research, we found a tendency for both teachers and learners to 'rein in' these potentially radical and challenging effects of the new media formations, to control and constrain them within more orthodox understandings of authorship, assessment, collaboration and formal learning.

That Web 2.0 tools can be refashioned for use in formal education settings is clearly demonstrated. However for Web 2.0 tools to add particular value to formal education, it seems necessary to 'rein in' those very things that make Web 2.0 so distinctive in the first place, to effectively emasculate the longevity, openness and inclusiveness that mark Web 2.0

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collaboration. When formal education is injected into Web 2.0, the inherent benefits die. However neither is Web 2.0 an 'antidote' for higher education. The issue is really one of the extent to which the 'more orthodox understandings of authorship, assessment, collaboration and formal learning' mentioned by Hemmi et al (2009) compromise the purpose and relevancy of formal education. As formal education does not claim a monopoly on teaching and learning, and because students enrol in formal education contexts with the expectation that they will engage with a knowledgeable member of faculty and wrestle with academic knowledge, it could be argued that an incompatibility of Web 2.0 tools with formal education should be of no concern, and even of no consequence. This is not to suggest that collaboration and authenticity are not important objectives for higher education, only that the contribution Web 2.0 tools might make to these goals does not quite fit in formal education contexts. While Web 2.0 tools are certainly usable in formal education, the usual genre underpinning their use is very much at odds. This is nicely described by Singer (2008:21) in her discussion about blogs:

There is an argument, of course, that making the blog part of a graded assignment virtually mandates that students see it that way. Ardent bloggers might protest that the nature of blogs is free, open, and voluntary, and that a 'points for posting' scheme kills all that is wonderful about the format. That may be... but when the edublogs were entirely free, open, and voluntary, students ignored them.

The first principle of using Web 2.0 tools in formal education must be to realistically consider the advantages of the tools, with particular critique of the characteristic differences between social networking and formal education.

Laurillard (2008:8) notes that “[t]echnology works best when it has to meet a challenge; and worst when it is a solution looking for a problem”. Key to designing for eXtended tools is having a clear need for them to meet. If e-learning is, as E-Primer 1.1 contends, “pedagogy empowered by digital technology”, then a clear sense of educational purpose is the best basis for applying any e-learning tool. Mason & Rennie (2008:50) provide four fundamental rules for applying Web 2.0 in education:

1. No panacea – use of web 2.0 should not be in response to course deficiencies.
2. Pedagogy first – educational goals should underpin the use of web 2.0 tools.
3. Initial induction – students must be trained in how to use the technology.
4. Need to be serious – the tasks “need to be real examples that are worthwhile doing”.

These are very practical considerations that give good summary for implementing any eXtended possibility for e-learning, not just those identifiable as examples of Web 2.0. As Web 2.0 tools are typically applied to courses for reasons of collaboration, the principles in E-Primer 4 “Online discourse” are transferable. However Web 2.0 tools must particularly emphasise a strong sense of audience for students, and feedback ought to be rapid and constructive.

## **5.5 Summary**

Web 2.0 tools do hold promise for formal education provided they are deliberately implemented, do not compromise the pursuit of academic knowledge, and emphasise dialogue, feedback and reflection. Outside of this, the words of Nick Allen (in Miller, 2007:5), ring true in that unless Web 2.0 can “help students learn more, provide access to larger numbers of students, improve learning outcomes, or help faculty teach... institutions should not be distracted by them”. However it is also necessary to not completely close off any sense of worth for Web 2.0 tools. Salmon (2009:535), with reference to Second Life, approaches the matter from a different angle:

Apply a simple test: does this application offer any potential for low-cost, high-value learning? If the answer is yes or maybe, then I believe we should make a small investment of time and energy to find out more.

We ought especially be open to exploring how Web 2.0 technologies might be used in education, however to do so by first being aware of their limitations and deliberate about what exactly it is we are aiming to achieve by using them. The research cited in this E-Primer indicates that the benefits of Web 2.0 in social settings do not easily translate to educational benefits. A summary of the issues to consider in translation follows:

- Blogs: genre of writing for self; longevity of ownership; the dynamic of usefulness in the long-term; tensions of providing too much/not enough direction.
- Wikis: establishing a sense of class ownership; the need to somehow reward individual contributors; need to enforce collaboration; small, well-defined tasks work best.
- ePortfolios: as with blogs, above.
- MUVes: complexity of the interface; limitations of communication; best suited to the experiential or simulated (not a comprehensive solution).
- M-learning: no standard set of features in devices, making specific uses beyond SMS difficult unless devices are provided; limitations of screen and interface; using a mobile device may distract from the actual exercise.

It seems likely that the issues associated with blogs, wikis and ePortfolios are more to do with implementation. MUVes and m-learning applications and hardware may eventually minimise the issues above.

A clear case for using eXtended tools ought to be established before applying them. Literacies provide a useful rationale. Citing Lankshear and Knobel (2003), Bolstad & Gilbert (2006:27) point out that merely applying new technologies to education because they are popular entirely misses the point. Rather, it is the responsibility of instructors to identify the literacies that such tools might encourage, “such as forms of analysis and synthesis associated

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with evaluating and producing knowledge in expert-like ways”. For this to apply to the eXtended possibilities considered here, it is clear that objectives and instructions must be carefully and realistically prepared. Bolstad & Gilbert (2006) add that using new technologies for new literacies will require establishing new cultures of use; what works well socially does not necessarily work well educationally. We must also be cautious to not mistake the potential for fun and engagement as potential for improved academic learning. It is a mistake to assume that intrinsically motivating and socially informal uses of Web 2.0 tools correspond to easy opportunity for formal education. Laurillard (2007:174), with specific reference to m-learning, actually places all of the eXtended possibilities discussed in this E-Primer into perspective in that they

offer exciting new opportunities for teachers to place learners in challenging active learning environments, making their own contributions, sharing ideas, exploring, investigating, experimenting, discussing, but they cannot be left unguided and unsupported. To get the best from the experience the complexity of the learning design must be rich enough to match those rich opportunities.

Successfully eXtending possibilities for e-learning in higher education demands a thoughtful partnership between instructor, student and technology. In the higher education context, this partnership is inevitably shaped by learning objectives and an overall learning design that is both informed and innovative.

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